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ABSTRACT

The Academy of Math, Science, and Engineering was established at the Luther Burbank High School of Sacramento, California as a rigorous and competitive academic alternative program. This report contains an evaluation of the second year (1984-85) of the program. Program accomplishments are reviewed in the categories of: (1) student enrollment; (2) student satisfaction; (3) parent satisfaction; (4) teacher satisfaction; (5) work requirements; (6) equipment and materials; (7) course outlines; and (8) teacher suggestions for improvement. Specific recommendations for the Acadamy program are listed. Also included are the program's student questionnaire, parent questionnaire, and the staff evaluation form. (ML)

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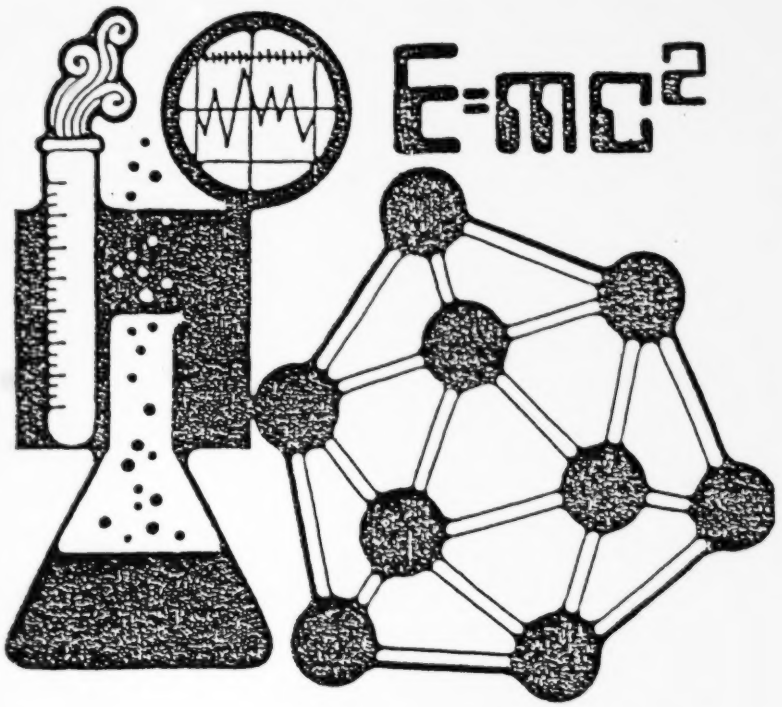
LUTHER BURBANK ACADEMY



of Math , Science & Engineering

Sacramento City Unified School District

Administrative & Evaluation Services Office

Evaluation Report

March 14, 1986
Evaluation Report No. 21
Series: 1985-86

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SACRAMENTO CITY UNIFIED SCHOOL DISTRICT
ADMINISTRATION BUILDING

March 14, 1986

Administrative and Evaluation Services Office No. 21
Series: 1985-86
Evaluation Report: EVALUATION OF THE ACADEMY OF MATH, SCIENCE, AND ENGINEERING AT LUTHER BURBANK HIGH SCHOOL DURING THE 1984-85 SCHOOL YEAR

The alternative high school program at Luther Burbank, the Academy of Math, Science, and Engineering, completed its second year in June. This alternative program provides a special focus on academic skills within a comprehensive high school setting. As described in "High School Plus," the Academy provides a rigorous and competitive academic program with the following major goals:

Development of intellectual skills in critical and analytical thinking, computing, and effective oral and written communication,

Preparation for more specialized and advanced studies in colleges and universities.

PROGRAM DESCRIPTION

The alternative school program at Luther Burbank is designed to promote positive public relations for education in the area and to attract students from throughout the district. The Academy provides a specific curriculum sequence that prepares students for college with skills in areas beyond those included in the regular comprehensive high school program. The areas of study are part of a seven-period school day that includes training designed to promote the use of critical and analytical thinking, and logic, speech and written communication. The school program is supplemented by outside speakers and field trips.

Curriculum outlines for the initial year of the various courses were prepared before the program began. This was especially necessary for the science, computer studies, engineering, and critical thinking courses, as they were either not available or were not adapted for the level and emphasis desired in the academy program. Students in the program are expected to complete the following requirements during high school:

4 years of Mathematics
4 years of Science
4 years of English
3 years of Computer Studies
2½ years of Engineering
2 years of Foreign Language

For the most part, Academy students are taught in classes with other Academy students. Their class contact with other students at the high school occurs through classes such as foreign language, physical education, and other electives. They take part in all campus activities outside of class time with other Luther Burbank students.

Student entrance to the Academy requires formal application and is based upon several considerations, including:

(1) performance on a screening test, the Differential Aptitude Test,
(2) counselor recommendations,
(3) grades obtained in school for past several years, and
(4) student and parent statements.

Before enrollment, students and parents are informed about Academy requirements, including its emphasis on homework.

The teachers working with the Academy are specially selected to teach the Academy classes--although most also teach other classes and students in the high school. The Academy teachers work closely with a counselor/coordinator who meets with them bi-weekly to discuss Academy concerns and to plan for special program activities.

PROGRAM EVALUATION PROCEDURES

The Academy program was evaluated during its second year to provide comparison and updated information to that obtained during the first year of program operation. The evaluation included gathering information from the program coordinator, the teachers, parents, and students. In addition to this information, other information was gathered about the students who participated in the Academy.

During May the students completed a ten-item survey which was nearly identical to the one used in the previous year's evaluation (see Attachment A). Surveys were completed by 89 students (or 80%). A survey was mailed to the parents of students at the Academy (see Attachment B). This survey was also similar to that used in the previous year. Parents returned a total of 51 surveys--a better than 50% response rate. Rather than a written teacher survey, a structured group interview was held. Academy teachers received copies of the evaluation questions in advance; they were also encouraged to make notes and add comments in addition to those they gave orally during the group interview (see Attachment C). Ten of the eleven Academy teachers took part in the group interview.

Information from these sources is presented in the next section. Samples of the surveys and the interview instrument, along with data summaries, are given in Attachments to this report.

PROGRAM ACCOMPLISHMENTS

Student Enrollments

In the first year of operation, 1983-84, the Academy had 68 students enrolled at the end of the year. Of these 68 students, 52 or better than three quarters, were reenrolled in the second or Sophomore year (14 were dropped for failure to maintain a 2.0 GPA). In addition, the Academy picked up 60 new enrollees as Freshmen, making a total enrollment of 112 students.

The Academy has an ethnic breakdown which is nearly equal between the White, Black, and Asian groups, while a much smaller percentage is Hispanic. The actual proportions for the Freshman and Sophomore classes and the Academy overall are given in Table 1 below.

Table 1

Ethnic Breakdown for Luther Burbank Academy Students, 1984-85

	White	Black	Asian	Hispanic
Freshmen	36%	24%	34%	6%
Sophomore	27%	39%	24%	10%
Academy Total	32%	31%	29%	8%
District Proportions	42%	23%	17%	17%

The Academy's drawing power is shown by the number of students it attracts from other district high schools. The first year over half of the enrollments were students from outside the Burbank attendance area. In the second school year, 42% of the students came from outside the Luther Burbank attendance area.

Student Satisfaction With Program

Enrollment in the Academy creates certain situations for students which are different from what they would encounter in the regular school situation. For instance, there is very little freedom to select electives, and the students/parents must provide transportation. For these reasons, a few questions used in the student survey the first year were omitted in the second year. Of the ten questions which remained, student responses differed by very little--no more than five percent plus or minus--from what they were a year ago.

Student survey items with positive responses from two-thirds or more of the students indicate general satisfaction with these aspects of the Academy program:

- Academic standards of classes met student expectations (72%)
- Academy classes have helped improve study habits and critical thinking skills (67%)
- Sufficient individual attention is given by teachers when needed (72%)
- Assistance is given by the counselor when needed (91%)
- Discipline at the school is satisfactory (67%)

In addition, students indicate continuing satisfaction with the program in these ways:

- The majority (86%) plan to continue their enrollment in the Academy program; and
- Many (72%) would recommend the Academy to their friends.

Students express less favorable responses to items on homework and extracurricular activities. Two-thirds (67%) of the students reported that they were assigned more homework than they expected. This response was nearly the same as the 70% reporting more homework the previous year.

Just slightly over half (52%) of the students reported that they were not able to participate in the extra-curricular activities of their choice at the high school. This was the same as reported by students in the first year.

A potential problem for students from other schools, getting transportation to the Academy is one that is real for one-fourth (26%) of the students. In comparison with the number of students enrolled from other schools, this may indicate a real deterrent to Academy enrollment that is faced by students from other schools.

Students were given the opportunity to comment on what they liked about the Academy and what suggestions they had for improving the Academy. Most of the students (84%) made comments. These comments were analyzed to determine the relative balance between positive and negative responses, to identify the most frequent positive and negative responses, and to note ways in which students felt the Academy could be improved.

Positive Student Responses--The vast majority of responses from students were positive in tone. The major areas which received positive comments were these:

- The way in which students and teachers got along--described by many students as having the atmosphere of "a large, happy family"
- The level of work done in the various classes--clearly seen as advanced and college preparatory--and the way in which different classes were related
- The extra-curricular activities and the field trips that support the curriculum
- The interest in learning which most of the students share
- The preparation for the future--both "real life" and college

Negative Student Responses--Only four students gave comments which were negative in tone. Three of these were concerned with the quantity of homework which Academy classes required. These three also noted that teacher expectations for some of the classes seemd to them to be too high. Two students were very critical of the teachers. These four students were very much the exception, considering the 71 students expressing satisfaction.

Parent Satisfaction With Program

Parent responses to the questionnaire from 51 families were compared with responses to similar questions from the previous year. More parents responded positively to questions in these areas:

- Parents received adequate information about the program before the start of the school year,
- Academic skills are being stressed in the program,
- Communication with the school is encouraged, and
- Students have changed in their use of critical thinking.

Responses to some questions, while still positive, showed a drop from the percent responding positively the previous year. These areas had lower positive responses:

- The Academy program meets expectations,
- Students are given help in developing good study habits,
- Students develop new interests,
- The Academy program is a positive experience, and
- Parents would like their children to continue in the Academy program.

One additional question was given in this year's survey on problems related to transportation to and from school. Sixteen (32%) of the responding parents indicated that transportation had been a problem.

Twenty-one (41%) of the responding parents gave comments and suggestions to improve the Academy program. The following areas reflect topics of repeated parent concern:

- Quality of some teaching--complaints about French and science as well as some generalized criticism, including lack of racial representation in the teaching staff.
- Communication with parents--some thought it excellent, others thought improvement was needed.
- Homework--two parents reported need for a regular homework schedule, one suggested more homework was needed.
- Types of classes offered--request for AP subjects in senior year, addition of molecular biology and typing, more challenging science program, more computer fundamentals.
- Student integration--parents indicated problems in mixing Academy and other Burbank students.
- Student challenge--one parent was very positive, saying that the program "has been a blessing," while another was negative, saying, "My child was not encouraged...and...has grown to hate the Academy." Others indicated that the program should be harder.
- Program promotion--one parent suggested more public relations efforts to help parents and students who might be interested in enrollment; also the need to raise funds for field trips.

Teacher Satisfaction with Program

The group interview with the Academy teachers was held to get information about four main areas:

- Work requirements for Academy classes and how they differ from other classes.
- Special equipment, housing, and materials needed for the Academy program.
- Available course outlines for Academy classes.
- Suggestions for Academy program improvement.

Each of these topics is discussed in the following sections, based upon the ideas expressed in the meeting and also the written responses prepared by many of the teachers.

Work Requirements for Academy Classes and How They Differ From Other Classes--Some teachers indicated that they were teaching a year or more above the usual class level, comparing the level to that of college prep classes. Teachers also said that they could move faster, could cover more difficult topics or problems, and needed to assign less repetitive homework--for example, English classes assigned more writing assignments than grammar assignments.

Although many of the students were identified as gifted, teachers found that many lacked self-discipline and were not handling homework assignments as well as anticipated. Teachers felt that the screening process was effective in identifying students with potential, but not necessarily those with the desire, maturity, and motivation to handle the Academy program as designed. They suggested several ways to prepare better students for the program: stress the program demands more during the screening process, improve the "study habits" unit at the beginning of 9th grade, and give more explanation to parents at the open house early in the school year.

Special Equipment, Housing, and Materials Needed for the Academy Program--Teachers indicated needs for special equipment for the science program, textbooks for the engineering course, and housing for the drafting and engineering labs.

Available Course Outlines for Academy Classes--Teachers had more complaints about this area than about the equipment and housing. They stated that the beginning course outlines were merely that--outlines which needed to be further developed. While English and social science handled this by using the college prep level course outlines, computer, engineering, science, and graphics needed much more development. One complaint was that books suitable for high school students (as opposed to college level texts) either didn't exist or hadn't been located. Suitable texts were needed for graphics and engineering, and a better text was needed for logic.

Teachers reported rewriting and expanding the existing course outlines on their own time during the year and the summer. Most of the teachers felt that they had to give more time to the Academy program classes than they gave to other classes in the regular Burbank program. Despite these added demands on their time, nearly all remained very supportive of the Academy. They emphasized the need for budget allocations to provide for the necessary curriculum development and for the texts and equipment.

Teacher Suggestions for Academy Program Improvement--Two major areas were reported as needing improvement. The first was the assignment of an administrator with time to coordinate the Academy program within the school and to promote it within the community. The second was early appointment of Academy teachers so that they had time to prepare for the courses they would be teaching. Strong concerns were expressed over the proposed increase in class size for the 1985-86 school year. Academy class sizes averaged about 24 students during the first two years, and teachers said this was one of the strong points of the Academy.

EVALUATION CONCLUSIONS

The Academy program is recognized by parents, students, and teachers as providing a program which is directed toward the two major goals of (1) development of intellectual skills, and (2) preparation for college/university studies. Neither of these goals can be directly measured at this point in the program's development.

The program is successful as a magnet school, attracting over 42% of its students from other areas. It is balanced racially between black, Asian, and white groups, while the Hispanic group representation is not proportional.

Students indicate satisfaction with the program, although they experience some problems with limited electives, the amount of homework, participation in extracurricular activities, and transportation (for those living outside the Burbank attendance area).

Parents were generally positive about most aspects of the Academy program. They, too, had concerns about homework, student integration, and extra-curricular activities, and transportation. In addition, some parents had concerns about the quality of some teaching and the lack of racial representation among the teaching staff.

Teachers felt that the Academy classes required extra preparation and planning, especially for those classes with minimal courses of study and inadequate textbooks. Teachers found that some students were not well-prepared or suited for the Academy program. They identified needs for special equipment and labs for some of their courses. They stated that the Academy program needed a full-time coordinator--especially as the number of students increased--to assist students, teachers, and to promote the program in the community.

RECOMMENDATIONS

The following recommendations are given for the Academy program:

1. Continue Academy promotion efforts to attract students from other schools.

2. Increase efforts to attract underrepresented Hispanic students from the district and within the Luther Burbank attendance area.

3. Plan parent and student prep meetings prior to school to fully explain the program and the requirement for students.

4. Schedule the existing study habits unit at the beginning of ninth grade.

5. Set up a schedule of limitations or special assignment days for homework in different classes.

6. Continue to promote in-school and extracurricular activities that will provide opportunities for Academy students to be with other Burbank students.

7. Provide funding for curriculum development on an ongoing basis for at least the next two years.

8. Provide an engineering lab suitable for junior and senior lab courses.

9. Review the need for a full-time program coordinator and determine a priority list of activities for the coordinator.

Nancy C. Enell
Director
Educational Evaluation Services Department

Approved:
Walter A. Parsons
Administrator
Administrative and Evaluation Services Office

WAP:NCE:mb/18M

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Attachment A

ACADEMY OF MATH, SCIENCE AND ENGINEERING

Luther Burbank High School

STUDENT QUESTIONNAIRE

You have been enrolled at the Luther Burbank Academy of Math, Science, and Engineering this school year. The educational program you are participating in is a new concept for high school students in Sacramento. Your opinions on some aspects of this new program are needed to better evaluate program operations. Please respond to the series of questions which follow.

A. Place a check mark in the appropriate ( ) following each question below.

		YES	NO
1.	Have the academic standards of the classes you enrolled in met your expectations?	(72%)	(28%)
2.	Do you believe the Academy classes have helped you to improve your study habits and critical thinking skills?	(67%)	(33%)
3.	Have you been assigned more homework than you expected?	(67%)	(33%)
4.	Have you been able to receive sufficient individual attention from your teachers when needed?	(72%)	(28%)
5.	Have you been able to participate in the extra-curricular activities of your choice at this high school?	(48%)	(52%)
6.	Have you been able to get assistance from your counselor when you needed help?	(91%)	(9%)
7.	Are you satisfied with the discipline at this school?	(67%)	(33%)
8.	Has transportation to and from school been a problem for you?	(26%)	(74%)
9.	Do you plan to continue your enrollment in the Academy program?	(86%)	(14%)
10.	Would you recommend the Academy to your friends?	(72%)	(28%)

Attachment B

ACADEMY OF MATH, SCIENCE AND ENGINEERING

Luther Burbank High School

PARENT QUESTIONNAIRE

Your child has been enrolled at the Luther Burbank Academy of Math, Science and Engineering this school year. Your assistance is requested in the evaluation of the academy program. A series of questions relating to various facets of program operations at the Academy follow.

A. Please respond to each question below by putting a check mark in the appropriate ( ).

		YES	NO
1.	Was adequate information about the program furnished parents before the start of the 1984-85 school year?	(92%)	(8%)
2.	Does the academic program organized for Academy students meet your expectations?	(84%)	(16%)
3.	Are academic skills being stressed?	(90%)	(10%)
4.	Do you feel communication with the school has been encouraged?	(88%)	(12%)
5.	Has your child been given help in developing good study habits?	(78%)	(22%)
6.	Do you believe your child has developed new interests due to the Academy program?	(65%)	(35%)
7.	Do you believe the Academy program has been a positive experience for your child?	(90%)	(10%)
8.	Have you noticed any change in your child's critical thinking that could be attributed to the Academy program?	(65%)	(35%)
9.	Would you like your child to continue in the type of program offered at the Academy?	(94%)	(6%)
10.	Has transportation to and from school been a problem?	(32%)	(68%)

B. What suggestions would you care to make to improve the Academy program? (Please use the back of this page for your suggestions.) 41% 59%

Attachment C

Luther Burbank Academy of Math, Science and Engineering

STAFF EVALUATION

We are doing a group evaluation of the Academy program with those teachers who have been actively involved in teaching one or more Academy classes. Last year's evaluation asked questions of both Academy and non-Academy teachers. It also required written responses to a number of questions. We are proposing just four major questions for the group interview—and they are listed below.

The group interview to evaluate the Academy program is scheduled for Tuesday, June 4th, during period 4B. If you prefer, you may write out your responses to give to me instead of discussing them orally at the group meeting.

Evaluation Questions

1. *Do the work requirements for the classes that you teach in the Academy program exceed the requirements you would have had for teaching other classes? How are the requirements the same or different?*

2. *What special equipment, housing or instructional materials have you needed for the Academy program? Have these been provided, or have you had problems securing appropriate materials, etc.?*

3. *Are the course outlines for Academy classes adequate for your instructional guidance and for producing the desired student outcomes?*

4. *What general suggestions do you have for Academy program improvement?*

Nancy C. Enell
Educational Evaluation Services
5/29/85